

FOURTH QUARTER 2018 GROUNDWATER MONITORING AND REMEDIAL STATUS REPORT

Part 2

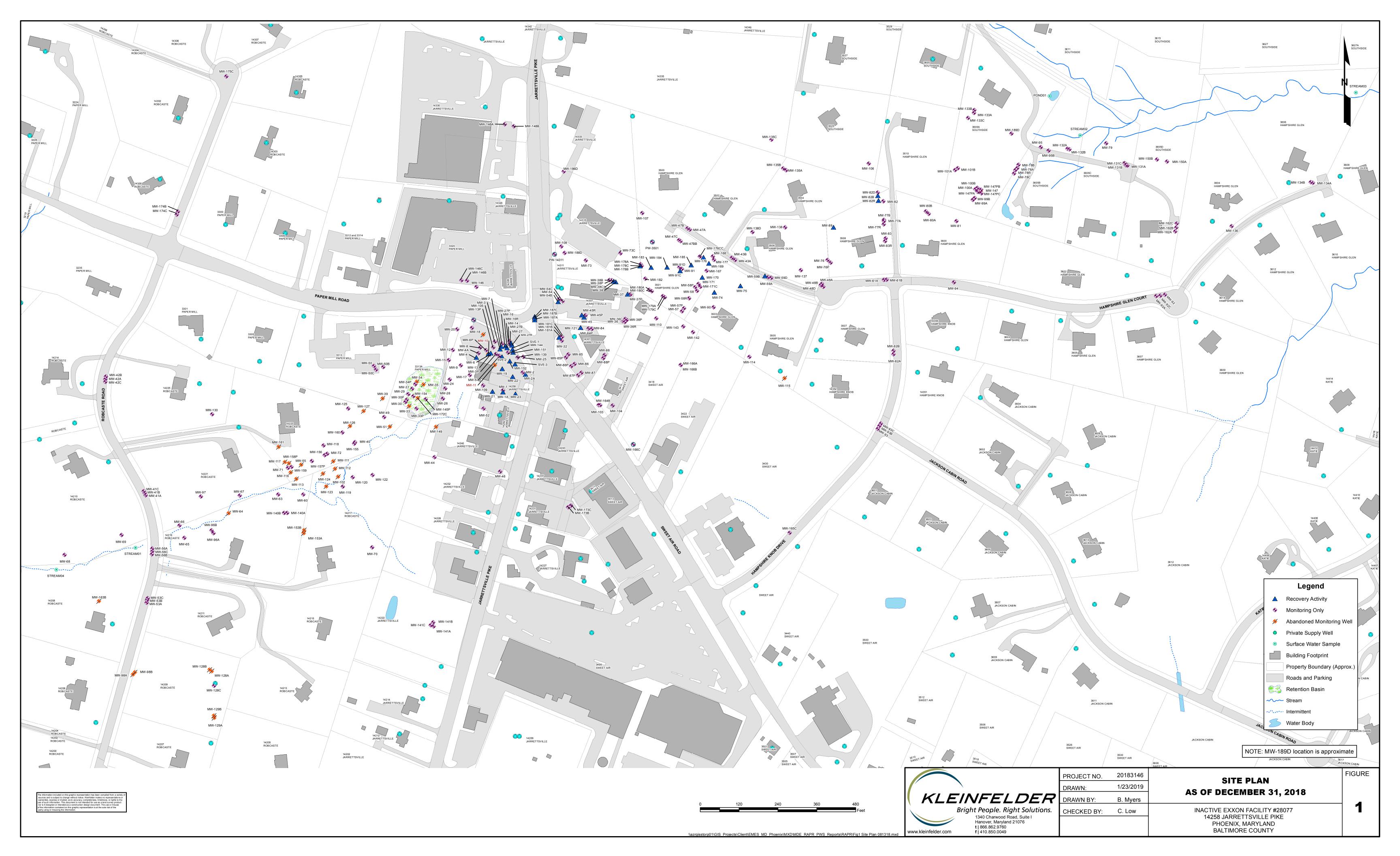
Inactive Exxon Facility #28077 14258 Jarrettsville Pike Phoenix, Maryland Case Number 2006-0303-BA2 Facility I.D. No. 12342

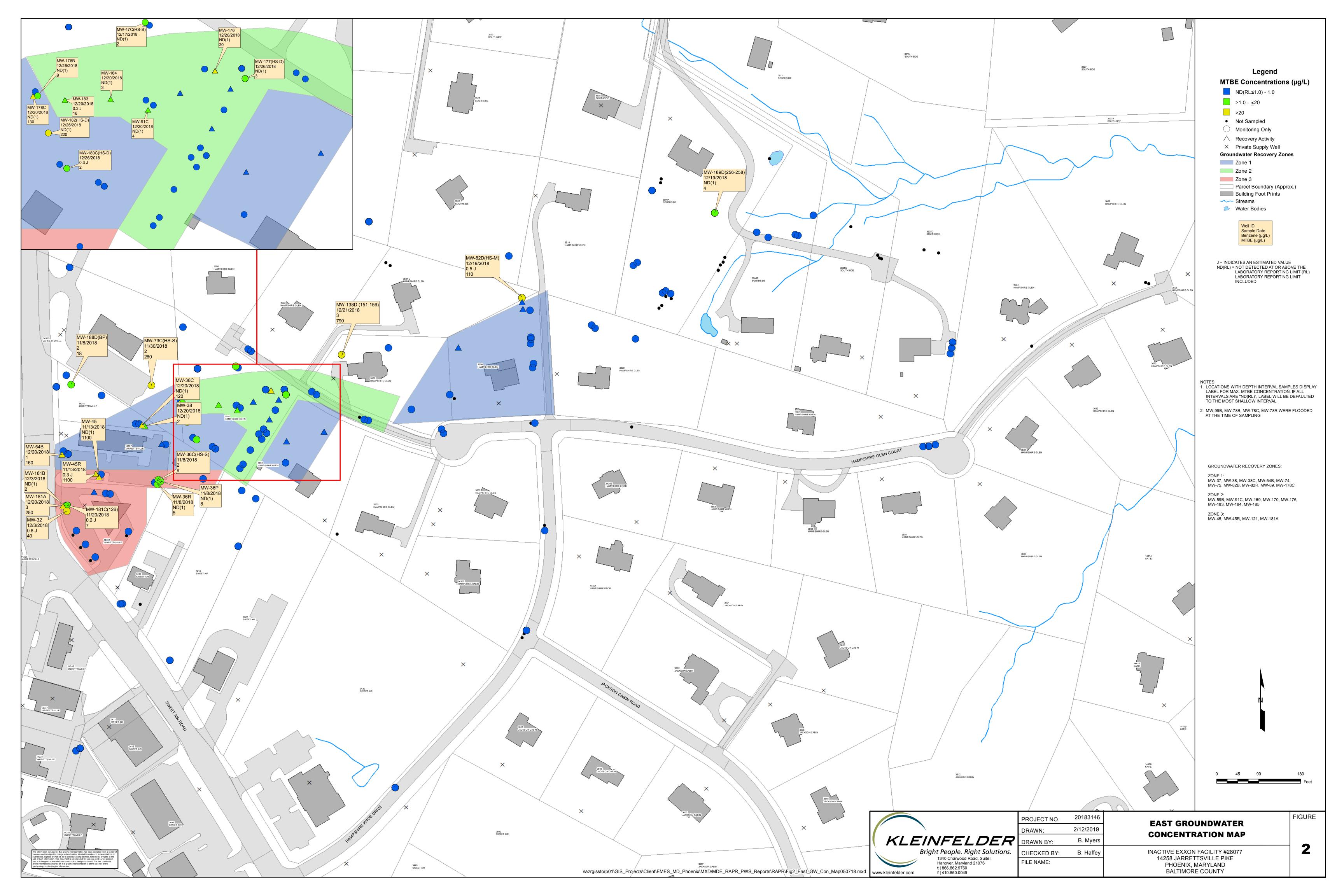
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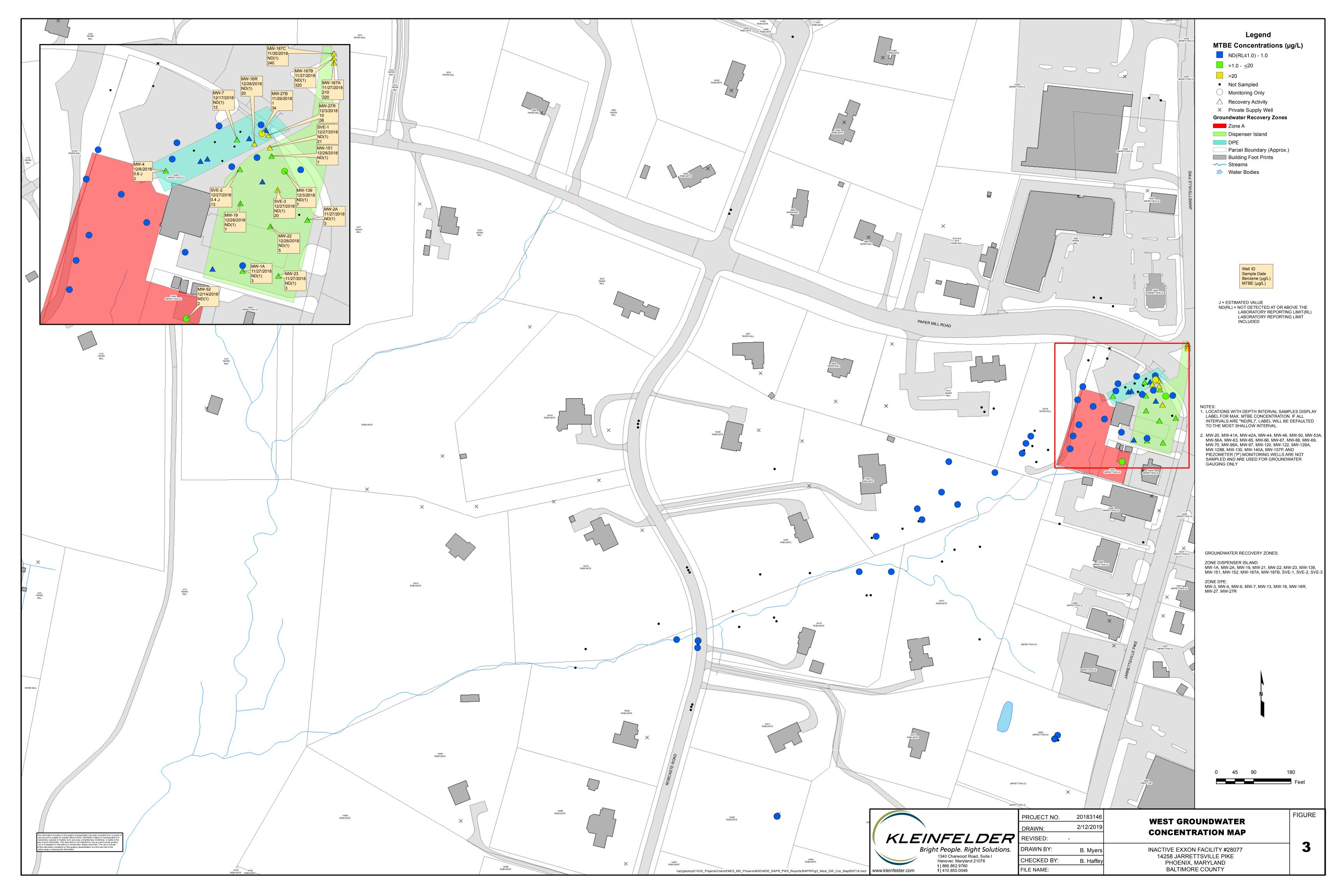
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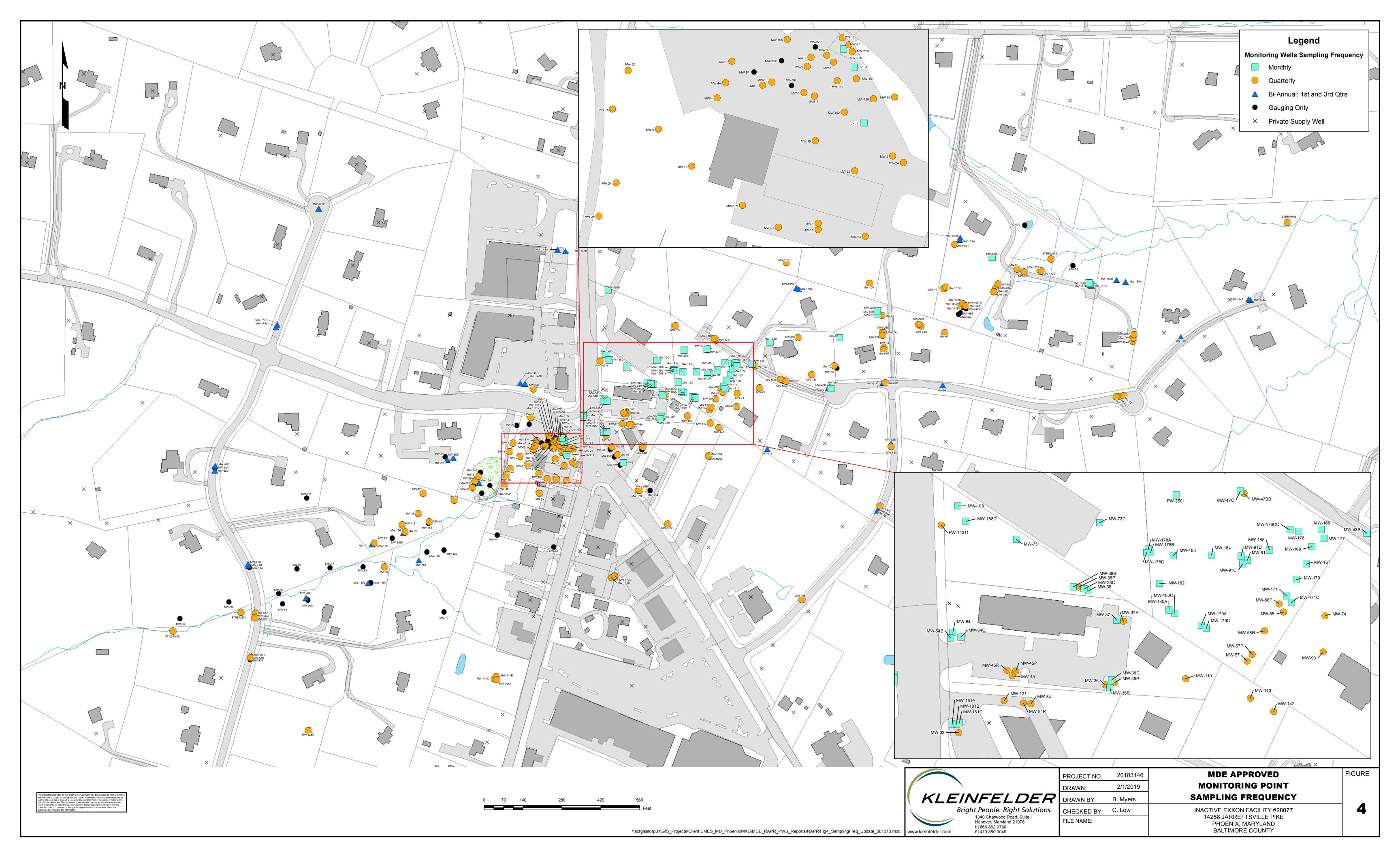


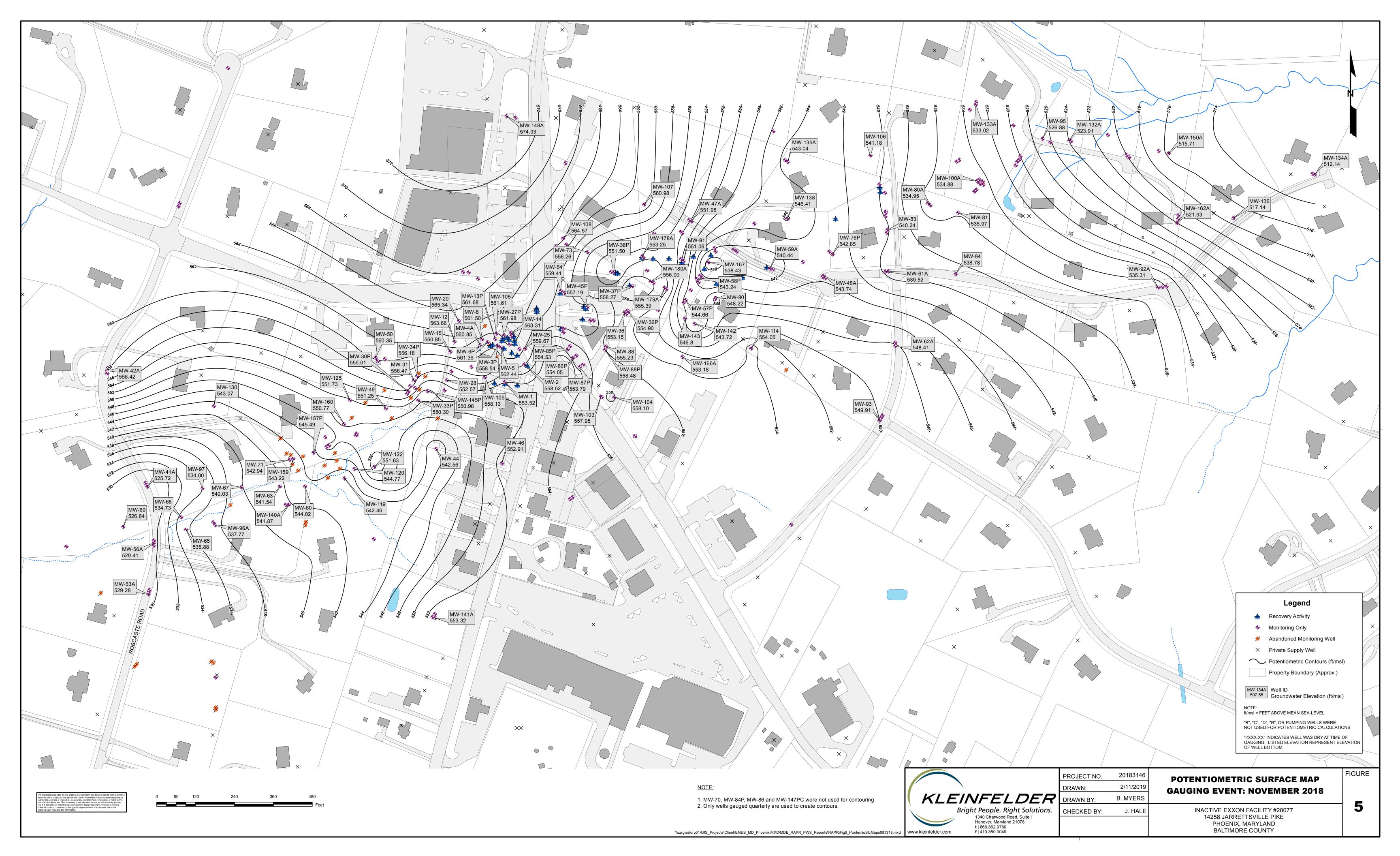
FIGURES

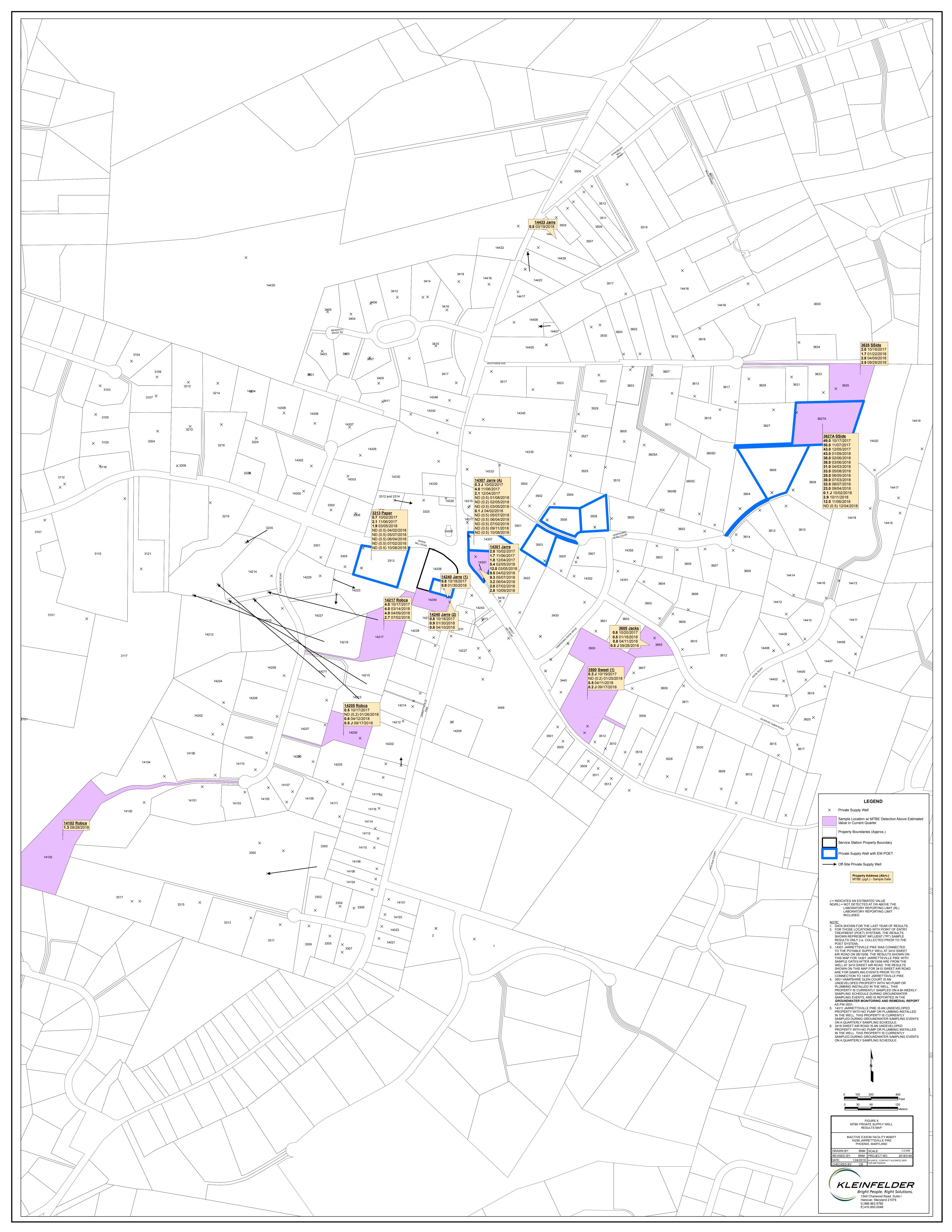


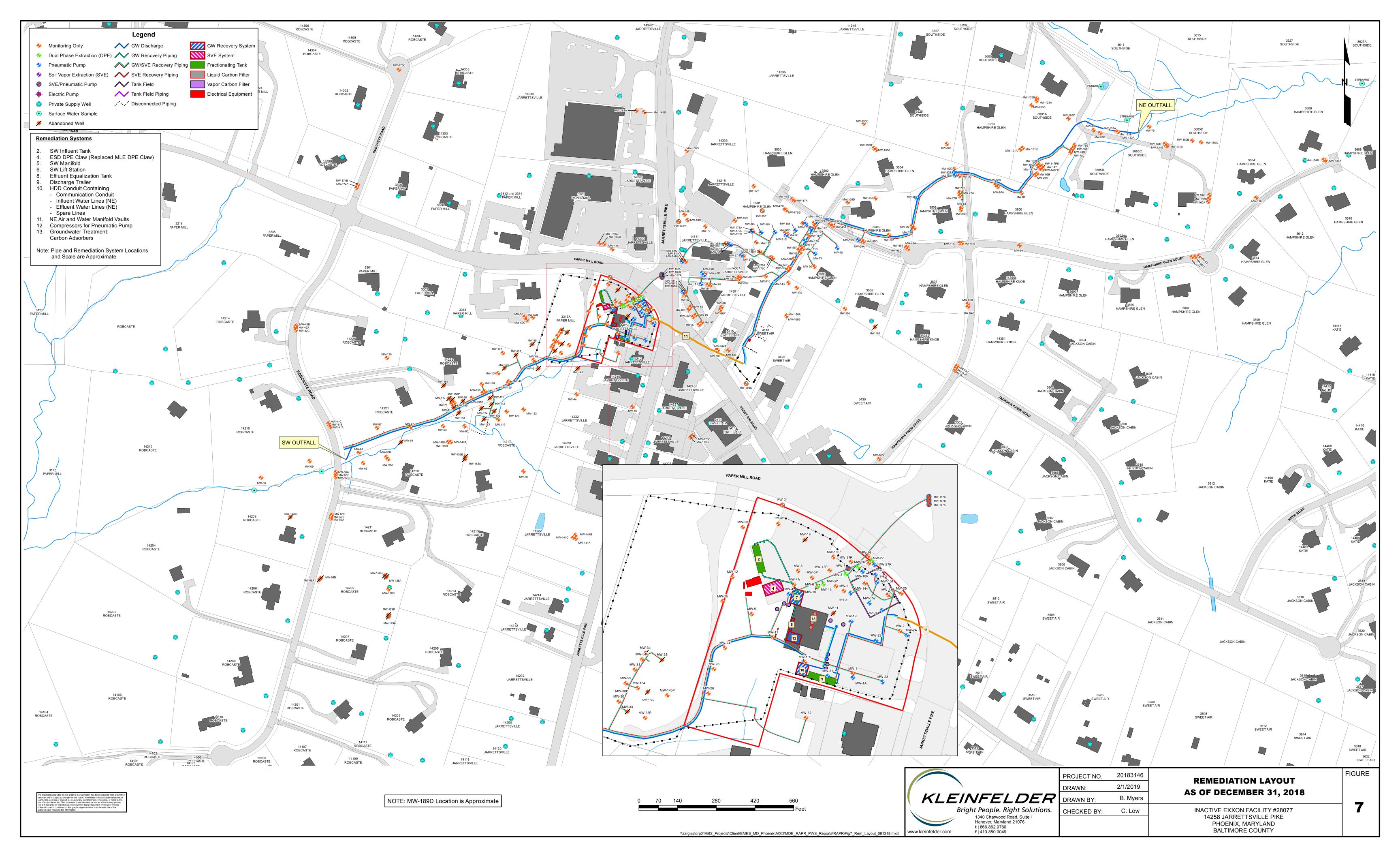














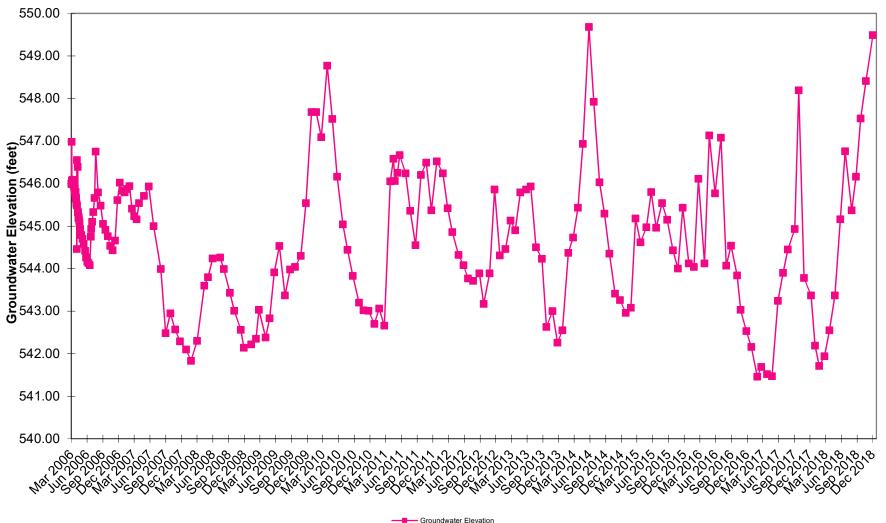
APPENDIX A SELECT HYDROGRAPHS

Appendix A MW-62A



Groundwater Elevation Trend (East) March 2006 - December 2018

Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD

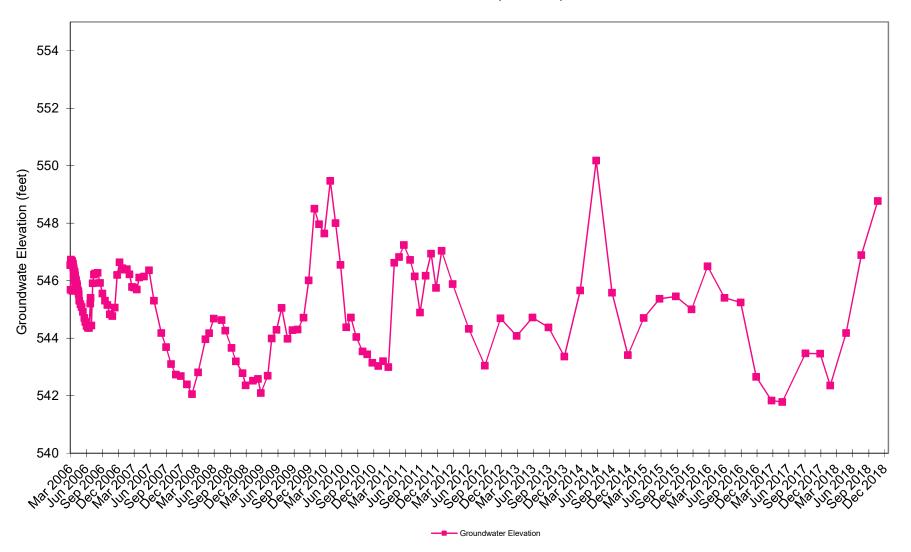


Appendix A MW-62B

Groundwater Elevation Trend (East)

March 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD



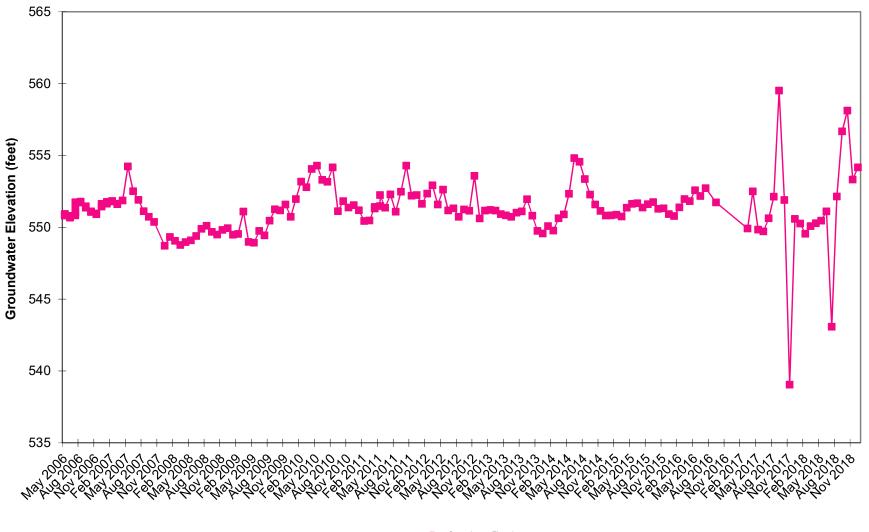


Appendix A MW-141A

Groundwater Elevation Trend (South)

May 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD

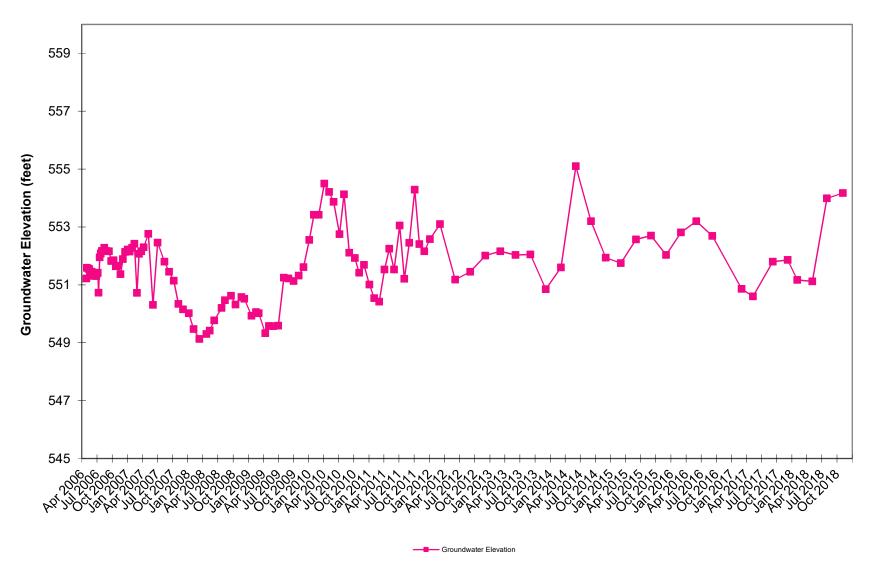




Appendix A MW-141B Groundwater Elevation Trend (South)



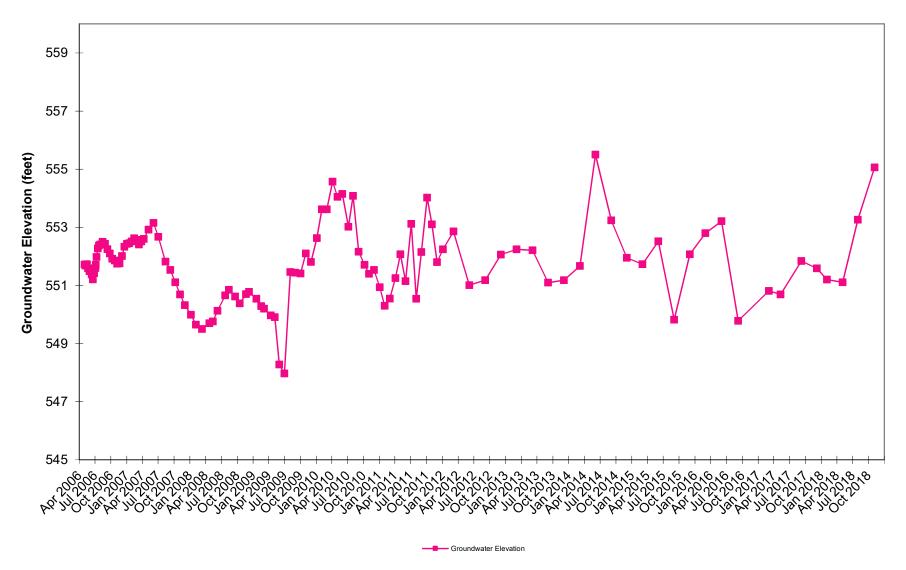
April 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD



Appendix A MW-141C Groundwater Elevation Trend (South)



April 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD

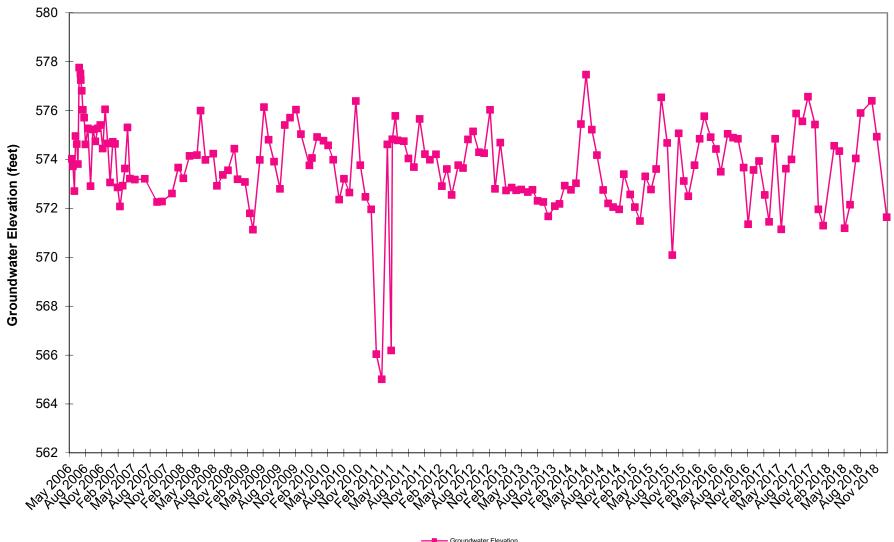


Appendix A MW-148A

Groundwater Elevation Trend (North)

May 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD



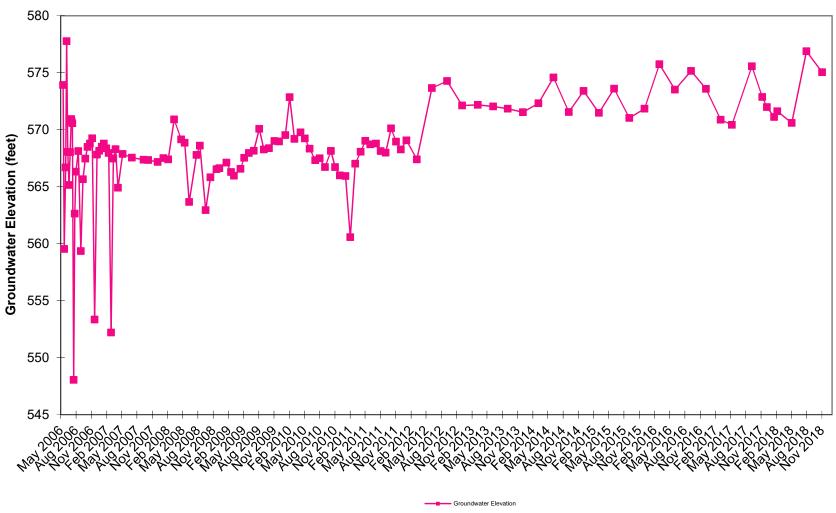


Appendix A MW-148B

Groundwater Elevation Trend (North)

May 2006 - December 2018 Inactive Exxon Facility # 28077 14258 Jarrettsville Pike, Phoenix, MD







APPENDIX B

FULL HISTORY OF REMEDIAL SYSTEM ACTIVITIES/MODIFICATIONS



APPENDIX B - HISTORY OF REMEDIAL SYSTEM ACTIVITIES/MODIFICATIONS

- February 17, 2006 Onset of groundwater recovery activities using mobile remediation equipment.
- February 2006 to September 2006 Temporary mobile groundwater recovery and treatment system; three SVE systems in the southwest quadrant Flame Oxidizer 750, Bisco Dual Claw, and Bisco Liquid Ring Pump (LRP) DPE system; and, four SVE systems in the northeast quadrant Flame Oxidizer 500, Airtech LRPs, MLE Claw 2, and ThermCat 500. Equipment operation and performance is detailed in the IRM Plan and Updated IRM Plan. Bisco LRP was shutdown in July 2006 and replaced with the MLE DPE Claw in August 2006, which extracts soil vapors and groundwater from the service station property extraction wells.
- October 2006 to March 2007 Temporary groundwater treatment systems operated in the northeast quadrant; these were shutdown when the integrated groundwater treatment system was brought online.
- October 2006 to March 2008 Temporary soil vapor extraction equipment was replaced with equipment designed for prolonged use at the site.
- February 5, 2007 All recovered groundwater is treated on the service station property utilizing a combination of air stripping, a fluidized bed bioreactor, and liquid phase GAC.
- February 9, 2007 ThermCat 500 (thermal oxidizer) was shutdown and was replaced by the Flame Oxidizer 500 SVE Blower extracting vapor from extraction wells in the northeast quadrant on 14307 Jarrettsville Pike, 3501 Hampshire Glen Court, and 3506 Hampshire Glen Court.
- February 9, 2007 ESD Dual Claw SVE system was brought online, operating on wells formerly operated by the Flame Oxidizer 500 SVE Blower, extracting vapor from extraction wells in the northeast quadrant on 14301 Jarrettsville Pike and 14307 Jarrettsville Pike.
- May 31, 2007 Temporary DPE system, Airtech LRPs (located on the Sweet Air Road property in the northeast quadrant) was shutdown, and replaced with the Bisco LRP DPE system (formerly used on the Service Station Property), extracting vapor and groundwater from extraction wells on 14307 Jarrettsville Pike and 3503 Hampshire Glen Court.
- May 31, 2007 Flame Oxidizer 500 vapor treatment unit was shutdown (SVE Blower still
 operated) because soil vapor is below SVE general permit discharge limits and the vapors
 are now directed through vapor phase GAC prior to discharge to the atmosphere.
- May 31, 2007 Flame Oxidizer 750 vapor treatment unit was shutdown (SVE Blower still
 operated) because soil vapors are below SVE general permit discharge limits and the
 vapors are now directed through vapor phase GAC prior to discharge to the atmosphere.
- August 9, 2007 The Bisco LRP was relocated from 3410 Sweet Air Road to 3418 Sweet Air Road (northeast quadrant).
- August 10, 2007 Flame Oxidizer 500 was taken offline, and transported offsite.
- August 10, 2007 ESD Dual Claw Skid I was brought online to replace the Flame Oxidizer 500, extracting vapors from the extraction wells in the northeast quadrant on 14307

- Jarrettsville Pike, 3501 Hampshire Glen Court, and 3506 Hampshire Glen Court and treating the vapors with vapor phase GAC.
- October 4, 2007 Flame Oxidizer 750 was taken offline and transported offsite. Piping retrofit and installation of the ESD Tri-Lobe was initiated in the former Flame Oxidizer 750 area.
- October 12, 2007 Bisco LRP was taken offline due to liquid ring pump failure, SVE wells operated by the Bisco LRP were re-directed to the ESD Dual Claw and ESD Dual Claw Skid I, and pneumatic pumps were added to MW-36, MW-74, and MW-75.
- October 31, 2007 ESD Tri-Lobe SVE system was brought online to replace the Flame Oxidizer 750, extracting vapors from extraction wells on the service station property and treating vapors with vapor phase GAC.
- February 18, 2008 MLE Claw 2 was taken offline and transported offsite, extracted vapors were temporarily re-directed to the ESD Dual Claw Skid I while installation of replacement system was initiated.
- March 11, 2008 Northeast Bisco Dual Claw was brought online to replace the MLE Claw 2 (located on the 3508 Hampshire Glen Court property), extracting vapors from extraction wells on 3506, 3508, and 3600 Hampshire Glen Court, and treating vapors with vapor phase GAC on 3418 Sweet Air Road.
- March 31, 2008 New recovery wells, MW-16R and MW-27R, were connected to the groundwater remediation system and brought online for both groundwater extraction using pneumatic pumps (GWP&T) and soil vapor extraction (SVE).
- May 7, 2008 Two SW groundwater storage fractionating tanks were transported offsite.
- May 12, 2008 New air compressor installed, Plant Air Compressor, supplying air to all SW and NE pneumatic pumps. Former air compressors remain in place as back-ups.
- June 10, 2008 Effluent groundwater fractionating tank (T702) emptied into effluent fractionating tank (T701) and transported offsite.
- June 17, 2008 Monitoring well MW-89 was brought online for both GWP&T and SVE.
- August 13, 2008 Monitoring well MW-121 was connected to the groundwater remediation system and brought online for both GWP&T and SVE.
- September 10, 2008 Monitoring well MW-45R was connected to the groundwater remediation system and brought online for both GWP&T and SVE.
- January 19-23, 2009 Three SVE pilot test wells were installed on the service station property to further evaluate onsite SVE recovery in the former UST field area.
- February 6, 2009 New air compressor installed as a back-up to the Plant Air Compressor; capable of supplying air to all SW and NE pneumatic pumps
- March 3, 2009 Recovery well MW-36 converted from DPE to GWP&T and SVE.
- April 17, 2009 Monitoring well MW-58R was connected to the groundwater remediation system and brought online for both GWP&T (NE02 Zone) and SVE (ESD Dual Claw Skid). Groundwater recovery and soil vapor extraction was re-started on MW-38.
- May 26, 2009 Monitoring wells, MW-169, MW-170, and MW-171 were connected to the groundwater remediation system and brought online for both GWP&T (NE01) and SVE (ESD Dual Claw Skid).
- November 11, 2009 Bisco Dual Claw SVE system permanently taken offline.
- November 13, 2009 Recovery well, SVE-3, was transitioned to all-season below grade piping and reconnected to the groundwater recovery system.
- December 15, 2009 Recovery wells, MW-78R and MW-100B, were taken offline for GWP&T. Northeast Bisco Dual SVE system permanently taken offline.
- February 18, 2010 Recovery well, MW-34, was taken offline for GWP&T.
- March 17, 2010 Recovery well, MW-33, was taken offline for GWP&T.

- April 19, 2010 Recovery well, MW-51, was taken offline for GWP&T.
- May 24, 2010 Recovery well, MW-124, was taken offline for GWP&T.
- May 28, 2010 Monitoring well MW-91C was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- June 1, 2010 Monitoring well MW-54 was connected to the groundwater remediation system using temporary below grade piping; and brought online for GWP&T.
- June 22, 2010 Recovery well MW-71 was taken offline for GWP&T.
- July 7, 2010 Monitoring well SVE-1 was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- September 20, 2010 Begin LGAC-only treatment for low-concentration groundwater stream. Air stripper is maintained onsite.
- September 25, 2010 Recovery well MW-54 was transitioned to all-season below grade piping.
- September 29, 2010 Monitoring well MW-176 was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- December 2, 2010 Recovery wells MW-91C, MW-176, and SVE-1 were transitioned to all-season below grade piping.
- December 28, 2010 Monitoring well MW-36R was connected to the groundwater remediation system and brought online for GWP&T. Recovery well MW-36 was taken offline for GWP&T.
- December 29, 2010 Monitoring well MW-178C was connected to the groundwater remediation system and brought online for GWP&T.
- May 20, 2011 Recovery well MW-28 was taken offline for GWP&T.
- June 15, 2011 Recovery well MW-111 was taken offline for GWP&T.
- July 15, 2011 Recovery well MW-102 was taken offline for GWP&T.
- August 15, 2011 Recovery well MW-123 was taken offline for GWP&T.
- September 15, 2011 Recovery well MW-113 was taken offline for GWP&T.
- October 12, 2011 Recovery well MW-60 was taken offline for GWP&T.
- April 24, 2012 Pneumatic pump in recovery well MW-171 identified as not operating properly and lodged in place inside the well borehole. Currently being used for monitoring only and "grab" sampling.
- May 15, 2012 Monitoring well MW-54B was connected to the groundwater remediation system and brought online for GWP&T.
- June 20, 2012 Monitoring well MW-139 was connected to the groundwater remediation system and brought online for GWP&T.
- July 20, 2012 Monitoring well MW-181B was connected to the groundwater remediation system and brought online for GWP&T.
- July 31, 2012 Monitoring wells MW-183, MW-184, and MW-185 were connected to the groundwater remediation system and brought online for GWP&T.
- August 31, 2012 ESD TriLobe SVE system taken offline due to high temperature.
- September 6, 2012 ESD TriLobe SVE system repaired and resumed operations.
- September 20, 2012 Monitoring well MW-38C was connected to the groundwater remediation system and brought online for GWP&T.
- August 21, 2013 Exposed piping was removed from a stream bed in southwest in accordance with MDE approved work plan.
- September 17, 2013 Monitoring well SVE-2 was connected and activated to the groundwater remediation system using temporary above grade piping.
- October 2, 2013 Soil vapor extraction initiated at SVE-2.

- October 10, 2013 ESD Dual Claw Trailer and ESD Dual Claw Skid I SVE systems permanently taken offline.
- November 19, 2013 Temporary groundwater recovery and soil vapor extraction was ceased at SVE-2 following completion of a two-month evaluation period using above grade piping.
- November 19, 2013 Recovery wells MW-25 and MW-80A taken offline for GWP&T.
- December 13, 2013 Recovery wells MW-80B and MW-109 taken offline for GWP&T.
- January 16, 2014 Recovery well MW-31 was taken offline for GWP&T.
- February 12, 2014 Recovery well MW-49 was taken offline for GWP&T.
- March 12, 2014 Recovery well MW-119 was taken offline for GWP&T.
- April 11, 2014 Recovery wells MW-55 and MW-112 were taken offline for GWP&T.
- May 12, 2014 Recovery well MW-117 was taken offline for GWP&T.
- May 13, 2014 MLE DPE Claw system permanently taken offline.
- June 18, 2014 ESD DPE Claw system (former ESD Dual Claw Trailer in the Northeast) was brought online as a replacement for MLE DPE Claw.
- June 20, 2014 Monitoring well SVE-2 was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T and SVE.
- September 22, 2014 Monitoring well MW-82B was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- November 3, 2014 Monitoring well MW-187B was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- March 25, 2015 Monitoring well MW-187A was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- April 14, 2015 Bioreactor taken offline, subsequently approved for decommissioning on June 16, 2015.
- May 6, 2015 Recovery wells MW-24, MW-26, MW-29, MW-30, MW-35, MW-52, and MW-154 were taken offline for GWP&T.
- June 15, 2015 Soil vapor extraction initiated at MW-187A.
- July 21, 2015 Electric pump in monitoring well MW-82B replaced with pneumatic pump.
- August 11, 2015 Soil vapor extraction initiated at MW-187B.
- August 31, 2015 Recovery wells MW-40, MW-72, MW-116, MW-118, MW-126, MW-127, and MW-156 were taken offline for GWP&T.
- September 18, 2015 Soil vapor extraction discontinued from MW-187A.
- September 21, 2015 Removal of FLUTe[™] liner from MW-78C.
- May 11, 2016 Soil vapor extraction resumed at MW-187A.
- May 18, 2016 well MW-151 was taken offline for GWP&T.
- June 6, 2016 Begin carbon only treatment for all groundwater recovery zones.
- July 26, 2016 Install new HDPE underground piping and valve manifolds within subsurface vaults to permanently bypass the above-grade groundwater processing and storage equipment located in the northeast. Permanently remove northeast lift station, northeast tank 201, and northeast manifold room from GWP&T operation.
- October 27, 2016 Remove offline LGAC vessels from NE remediation section.
- December 7, 2016 Recovery well MW-32 converted to a monitoring well only after the water return line failed due to corrosion.
- December 2016 Remove remaining above-grade equipment and components from the NE remediation section.
- April 12, 2017 Tri-Lobe SVE system taken offline indefinitely; SVE wells MW-7, MW-16R, MW-27R, MW-187A and MW-187B connected to the ESD DPE law system.

- June 23, 2017 Pump removed from MW-139 to replace non-functioning pump in MW-187B.
- September 19, 2017 Pneumatic pump installed in MW-168 for temporary pump test, running off of air supply and water return from the MW-169 vault.
- October 10, 2017 Pumps in recovery wells MW-178C and MW-183 were lowered an additional 50 feet to a total depth of 200 feet below grade.
- October 23 and 24, 2017 Recovery well MW-181B was converted into a monitoring well.
 Monitoring well MW-181A was converted into a recovery well.
- December 29, 2017 Pump and temporary above-grade piping connections removed from MW-168, terminating temporary pumping test.
- February 26, 2018 One of the southwest influent tanks (T-102) was removed from site, all influent (untreated water) is now stored in remaining tank T-202.
- April 16, 2018 Pneumatic pump reinstalled in MW-168, to continue pumping test longerterm.
- July 30, 2018 MW-59D converted into a monitoring well as part of the MDE-approved Northeast sequential recovery well conversion. MW-151 pump removed from service.
- August 3, 2018 MW-59B pump removed from service, MW-59D redeveloped.
- August 13, 2018 Recovery well MW-57 converted into a monitoring well as part of the MDE-approved Northeast sequential recovery well conversion. Other wells approved for conversion had pumps removed as previously reported, including MW-181B removed on 10/23/17, MW-76 removed on 5/21/18, MW-59D removed on 7/30/18, MW-32 removed 12/7/17, and MW-43A removed on 1/31/13.
- August 30, 2018 MW-59B pump reinstalled.
- September 11, 2018 Subterranean leak was identified at location of abandoned well MW-51. Air turned off to southwest zones A-E.
- September 12 through 13, 2018 Recovery wells MW-110, MW-85, MW-77A were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion. Also scheduled for monitoring well conversion in September was MW-58, although the pump for MW-58 had already been removed on 3/28/18 due to the pump not functioning properly.
- September 27, 2018 Pump and temporary above-grade piping connections removed from MW-168, terminating temporary pumping test.
- October 8, 2018 Recovery wells MW-36R, MW-77R, MW-87, and MW-137 were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- October 16, 2018 Pump installed in MW-187C to a depth of 150' bgs.
- October 26, 2018 Pumps were removed from MW-9 and MW-17.
- November 6, 2018 Recovery well MW-77B was converted into a monitoring well and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- November 7, 2018 Recovery wells MW-58R, MW-82, and MW-84 were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- December 5, 2018 MW-188D Packer removed and purged of 275 gallons.
- December 5 through 20, 2018 New remediation system components (influent tank T-100, effluent tank T-200, transfer pumps and totalizers) installed and tested.